

4.2.3. **Social.**

- a. Recreation. There would be a long-term minor impact from the reduction in recreation from the erosion of the beaches and a reduction in the recreational areas available. There would also be a minor reduction in recreation from the loss of navigable capacity of the Pass.
- b. Aesthetics. There would be a minor long-term reduction in the beach and its aesthetic qualities.

4.2.4. **Economic impacts.** There would be a long-term impact on economics from the reduction in revenues attributed to the loss of recreational beach and the loss of navigable capacity of the channel.

4.2.5. **Cumulative effects.** If this action was considered in conjunction with other similar projects and similar No Actions, there would be a substantial adverse impact on recreation and economics of the State of Florida.

4.2.6. **Unavoidable effects.** There would be an eventual loss of navigable capacity of the waterway and recreational beach from the continual sedimentation of the channel and erosion of the shoreline.

4.2.7. **Irreversible and Irretrievable Resource Commitments.** There would be no irreversible or irretrievable commitment of resources from the selection of this alternative.

4.3. **ALTERNATIVE 1. Dredging and Anastasia State Recreation Area Placement (Figure 2).**

4.3.1. **Physical**

- a. Water quality. There would be short-term minor increases in turbidity levels at the dredging site and in the surf zone from the return water. The turbidity levels would be minor because the material is sandy.
- b. Navigation. There would be a short-term minor impact on navigation from the presence and operation of the dredging equipment. There would be a long-term medium benefit to navigation from maintaining the Inlet.
- c. Historic Properties. As described in section 3.0 Affected Environment, potentially significant properties are located in the vicinity of St. Augustine Harbor. The areas of advance maintenance, near the intersection of the harbor entrance channel and the Intracoastal Waterway (IWW), have been investigated for the presence of significant historic properties. Investigations included a magnetometer survey and diver investigation of potentially significant magnetic anomalies. Reports

resulting from those surveys have been coordinated with the SHPO. In a January 19, 1996 telephone conversation, the SHPO concurred with the District's no effect determination for maintenance and advance maintenance dredging at St. Augustine. Although no significant archeological resources are recorded for the Conch Island beach disposal area, no systematic surveys have been conducted for the proposed disposal area. Since the Corps constructed the harbor, sand accreted along Crazy Bank shoal and created the island south of the inlet. During the historic period, ships had crossed through the area which is now known as Conch Island. Although significant historic shipwrecks may be located in the area covered by Conch Island, it is the District's opinion that placement of dredged material will not have an adverse effect on such resources. The SHPO concurred with the no adverse effect for beach disposal in a June 16, 1995 letter.

4.3.2. Biological.

- a. Manatees. There would be no impact on manatees during dredging if the special conditions for operating the equipment are adhered to (Appendix II).
- b. Seagrasses. There would be no impacts on seagrasses as the seagrass bed are far removed from the navigation channel.
- c. Anastasia beach mouse. No adverse construction impact would occur with implementation of either a dune avoidance measure or a mouse capture and relocation program. There, would be a long-term minor benefit by providing additional sandy material to maintain the stability of the dunes which is the mouses' habitat.
- d. Sea turtles. There would be a minor adverse impact on sea turtle nesting should the dredging occur during the nesting season. A nest monitoring and relocation program would insure that the impacts are minimal. If the work is scheduled outside the nesting season no impacts are anticipated. There would be some long-term minor benefits to sea turtle nesting by helping maintain the beach nesting environment.

4.3.3. Social.

- a. Recreation. There would be a medium short-term impact on recreational boating and beach activities from the presence and operation of the dredging equipment. However, there would be a medium long-term benefit to recreation from the maintenance of the channel and the beach.
- b. Aesthetics. There would be a major short-term impact on beach aesthetics from the presence and operation of pipeline and heavy equipment to move the spoiled material and pipeline and from the discharge plume. There would be a major short-

term benefit to the aesthetics of the beach by help maintaining the beach environment.

4.3.4. **Economic.** There would be a long-term medium benefit to local economics from revenues generated because tourism would use a viable recreational navigation channel and beach environment. There would be a short-term medium stimulus to the local economy from the sale of goods and services in support of the dredging work.

4.3.5. **Cumulative effects.** There would be no cumulative effects from the selection of this alternative.

4.3.6. **Unavoidable effects.** There would be short-term adverse impacts on aesthetics, beach recreation and mostly recreational navigation associated with the construction period.

4.3.7. **Irreversible and Irretrievable Resource Commitments.** There would be no irreversible or irretrievable commitment of resources from the selection of this alternative.

4.4. **ALTERNATIVE 2 . Dredging and St. Augustine Beach Placement (Figure 2).**

4.4.1. **Physical**

a. Water quality. There would be short-term minor increases in turbidity levels at the dredging site and in the surf zone from the return water. The turbidity levels would be minor because the material is sandy.

b. Navigation. There would be a short-term minor impact on navigation from the presence and operation of the dredging equipment. There would be along-term medium benefit to navigation from maintaining the Inlet.

c. Historic Properties. As described in section 3.0 Affected Environment, potentially significant properties are located in the vicinity of St. Augustine Harbor. Because maintenance dredging will be conducted in an area that was previously dredged, it is not likely that significant historic properties will be affected by maintenance activities. Areas of advance maintenance dredging have been subjected to a cultural resource magnetometer survey and diver investigation of potentially significant magnetic anomalies. Although no significant historic properties are recorded for the St. Augustine Beach disposal area, no systematic surveys have been conducted for that area. The shoreline at St. Augustine has eroded and been nourished several times. Because of past construction activities, it is the District's opinion that placement of dredged material on the beach at St. Augustine will not have an adverse effect on significant historic properties.

4.4.2. **Biological.**

- a. Manatees. There would be no impact on manatees during dredging if the special conditions for operating the equipment are adhered to (Appendix II).
- b. Seagrasses. There would be no impacts on seagrasses as the seagrass bed are far removed from the entrance of the navigation channel.
- c. Anastasia beach mouse. There would be no impacts on the beach mouse as the pipeline and construction activities will not affect the dune environment along the Anastasia Island because the pipeline would be placed below the waterline outside the surf zone.
- d. Sea turtles. There would be a minor adverse impact on sea turtle nesting should the dredging occur during the nesting season. A nest monitoring and relocation program would insure that the impacts are minimal. If the work is scheduled outside the nesting season no impacts are anticipated. There would be some long-term minor benefits to sea turtle nesting by helping maintain the beach nesting environment.

4.4.3. **Social.**

- a. Recreation. There would be a medium short-term impact on recreational boating and beach activities from the presence and operation of the dredging equipment. However, there would be a minor long-term benefit to recreation from the maintenance dredging of the recreational channel and the placement of sand on the beach.
- b. Aesthetics. There would be a major short-term impact on beach aesthetics from the presence and operation of pipeline and heavy equipment to move the dredged material and pipeline and from the discharge plume. There would be a minor short-term benefit to the present aesthetics of the beach by help maintaining the beach environment.

4.4.4. **Economic.** There would be a long-term medium benefit to local economics from revenues generated because of a viable recreational navigation channel and beach environment. There would be a short-term minor stimulus to the local economy from the sale of goods and services in support of the dredging work.

4.4.5. **Cumulative effects.** There would be no cumulative effects from the selection of this alternative.

4.4.6. **Unavoidable effects.** There would be short-term adverse impacts on aesthetics, beach recreation and recreational navigation associated with the construction period.

4.4.7. **Irreversible and Irretrievable Resource Commitments.** There would be no irreversible or irretrievable commitment of resources from the selection of this alternative.

4.5. ALTERNATIVE 3. Dredging and Nearshore Placement (Figure 2).

4.5.1. Physical

a. Water quality. There would be short-term minor increases in turbidity levels at the dredging site and in the surf zone from the return water. The turbidity levels would be minor because the material is sandy.

b. Navigation. There would be a short-term minor impact on navigation from the presence and operation of the dredging equipment. There would be along-term medium benefit to navigation from maintaining the Pass.

c. Historic Properties. As described in section 3.0 Affected Environment, potentially significant properties are located in the vicinity of St. Augustine Harbor. Because maintenance dredging will be conducted in an area that was previously dredged, it is not likely that significant historic properties will be affected by maintenance activities. The area of proposed advance maintenance has been subjected to a cultural resource magnetometer and diver investigation of potentially significant magnetic anomalies. No significant historic properties were identified in the areas proposed for advance maintenance. Reports resulting from these surveys have been coordinated with the Florida SHPO and the SHPO concurs with the District's no effect determination for the proposed dredging. Although no significant historic properties are recorded for the near shore disposal area, no systematic surveys have been conducted for that area. It is the District's opinion that placement of dredged material in the near shore area will not have an adverse effect on significant historic properties which may be located there. The SHPO concurred with the Corps' determination in a June 16, 1995 letter.

4.5.2. Biological.

a. Manatees. There would be no impact on manatees during dredging if the special conditions for operating the equipment are adhered to (Appendix II).

b. Seagrasses. There would be no impacts on seagrasses as the seagrass bed are far removed from the entrance of the navigation channel.

c. Anastasia beach mouse. There would be no impacts on the beach mouse as the pipeline and construction activities will not affect the dune environment along the Anastasia Island because the pipeline would be placed below the waterline outside the surf zone.

d. Sea turtles. There would be a minor adverse impact on sea turtle nesting should the dredging occur during the nesting season. A nest monitoring and relocation program would insure that the impacts are minimal. If the work is scheduled outside the nesting season no impacts are anticipated. There would be some long-term minor benefits to sea turtle nesting by helping maintain the beach nesting environment.

4.5.3. **Social.**

a. Recreation. There would be a medium short-term impact on recreational boating and beach activities from the presence and operation of the dredging equipment. However, there would be a minor long-term benefit to recreation from the maintenance of the recreational channel and the beach.

b. Aesthetics. There would be a major short-term impact on beach aesthetics from the presence and operation of pipeline and heavy equipment to move the spoiled material and pipeline and from the discharge plume. There would be a minor short-term benefit to the aesthetics of the beach by help maintaining the beach environment.

4.5.4. **Economic.** There would be a long-term medium benefit to local economics from revenues generated because of a viable recreational navigation channel and beach environment. There would be a short-term minor stimulus to the local economy from the sale of goods and services in support of the dredging work.

4.5.5. **Cumulative effects.** There would be no cumulative effects from the selection of this alternative.

4.5.6. **Unavoidable effects.** There would be short-term adverse impacts on aesthetics, turbidity and navigation associated with the construction.

4.5.7. **Irreversible and Irretrievable Resource Commitments.** There would be no irreversible or irretrievable commitment of resources from the selection of this alternative.

5.0. LIST OF PREPARERS. The following professionals prepared the Environmental Assessment.

<u>NAME</u>	<u>DISCIPLINE</u>	<u>EXPERIENCE</u>	<u>ROLE IN PREPARING EIS</u>
William J. Fonferek	Biologist	16 years environmental impacts assessment	NEPA Coordinator, Biological Impact Assessment, Endangered Species Consultation
Diana Bisher	Civil Engineer	6 ½ years experience	Project Manager
Paul C. Stevenson	Landscape Architect	11 years experience recreation design, construction and development	Recreation Resources Analysis and Mitigation Development
Janice E. Adams	Archeologist	10 years cultural resource assessment	Cultural Resource Impact Analysis and Coordination
Matthew Miller	Environmental Engineer	3 years	HTRW and Water Quality Investigations and Impact Assessment

6.0. CONSULTATION WITH OTHERS - PUBLIC INVOLVEMENT PROCESS. A public notice (PN-SAH-199) dated 4 May 1995 was issued for the project (Appendix III).

6.1. In a June 16, 1995 letter, the Florida Division of Historical Resources (State Historic Preservation Officer) concurred with the District's determination that maintenance of areas which had been previously dredged would not have an adverse effect on historic properties included in or eligible for inclusion in the National Register of Historic Places. In the same letter, that office concurred with the District's no adverse effect determination for each of the three disposal area options. The District has conducted historic property investigations for the advance maintenance areas adjacent to the Intracoastal Waterway. No significant historic properties were identified during those investigations. Therefore, it is the District's determination that advance maintenance will have no effect on significant historic properties. The SHPO concurred with this determination during a January 19, 1996 telephone conversation.

RESPONSE: Advance maintenance was not be included in the base project. Because it was determined that advance maintenance will not affect significant historic properties, this work would be included in the project.

6.2. The National Oceanic and Atmospheric Administration responded by letter dated 23 May 1995 stating that it anticipated that the project would only have minimal adverse impacts on marine or anadromous fishery resources.

6.3. The Florida Department of Environmental Protection responded by letter dated 15 May 1995 stating that the placement of material on the beach is necessary for compliance with the memorandum of understanding regarding the disposal of beach-compatible maintenance dredge material and is critical for relief of shoreline erosion occurring in the St. Augustine Beach area.

6.4. The Department of Environmental Protection responded to the public notice by letter dated 24 May 1995 with comments provided by the Division of Parks and Recreation. Their comments concern the placement of material on the Anastasia State Park versus the St. Augustine Beach.

RESPONSE: This issue has been resolved and a portion of the material would be placed on Park property.

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8.0. REFERENCES

US Army Corps of Engineers. 1947. Survey - Review Report, *St. Augustine Harbor and vicinity, Florida*.

US Army Corps of Engineers. 1956. General Design Memorandum. *Ocean Entrance Channel and Protective Works Portion of the St. Augustine Harbor, Florida Project*.

US Fish and Wildlife Service. 1987. *Endangered and Threatened Species of Southeastern United States. Region 4, Atlanta, Georgia*.

US Fish and Wildlife Service. 1993. Fish and Wildlife Coordination Act Report. *Section 933 Study for the Maintenance Dredging of St. Augustine Harbor*.

APPENDIX I

SECTION 404(B)(1) EVALUATIONS

SECTION 404(b)(1) EVALUATION DREDGED MATERIAL

I. Project Description

- a. Location. St. Augustine Harbor, St. Johns County, Florida.
- b. General Description.

Alternative 1 - Dredging and Beach Placement at Anastasia State Recreation Area. The proposed work consists of periodic maintenance dredging in the Entrance Channel to the required depth and width of 16 feet by 200-300 feet, with an allowable overdepth of 3 feet, and the adjacent segments of the Intracoastal Waterway to the required depth and width of 12 feet by 125 feet with a 2-foot overdepth. The material is predominately sand with some shell. It is estimated that approximately 500,000 cubic yards of material will be dredged during this periodic dredging event as necessary to provide safe depths for vessels. Materials will be placed in the beach disposal area adjacent to the Anastasia State Recreation Area. A trapping and relocation program would be implemented for the Anastasia beach mouse. A sea turtle monitoring and nest relocation program would be implemented if construction occurs during the nesting season. A migratory bird protection program would be implemented to avoid nesting areas during the 1 April-31 August nesting season. Special construction techniques would be implemented to avoid impacting recreational pedestrian and vehicular traffic.

Alternative 2 - Dredging and St. Augustine Beach Placement. The proposed work consists of periodic maintenance dredging in the Entrance Channel to the required depth and width of 16 feet by 200-300 feet, with an allowable overdepth of 3 feet, and the adjacent segments of the Intracoastal Waterway to the required depth and width of 12 feet by 125 feet with a 2-foot overdepth. The material is predominately sand with some shell. It is estimated that approximately 500,000 cubic yards of material will be dredged during this periodic dredging event as necessary to provide safe depths for vessels. Materials will be placed in the beach disposal area adjacent to the St. Augustine Beach. In order to avoid impacts to recreation, the Anastasia beach mouse, nesting sea turtles and migratory bird nesting, the pipeline will be submerged, parallel to the shoreline. A sea turtle monitoring and nest relocation program would be implemented if construction occurs during the nesting season.

Alternative 3 - Dredging and Nearshore Placement. The proposed work consists of periodic maintenance dredging in the Entrance Channel to the required depth and width of 16 feet by 200-300 feet, with an allowable

overdepth of 3 feet, and the adjacent segments of the Intracoastal Waterway to the required depth and width of 12 feet by 125 feet with a 2-foot overdepth. The material is predominately sand with some shell. It is estimated that approximately 500,000 cubic yards of material will be dredged during this periodic dredging event as necessary to provide safe depths for vessels. The beach area will be utilized whenever possible; however, the nearshore disposal area will be used only when conditions, circumstances and funding constraints warrant. Material placed in the nearshore disposal area will be placed as close as possible to the beach to allow the material to be carried by wave action to the adjacent beaches. In order to avoid impacts to recreation, the Anastasia beach mouse, nesting sea turtles and migratory bird nesting, the pipeline will be submerged, parallel to the shoreline.

c. Authority and Purpose. When a Federal navigation project is authorized, it is generally the responsibility of the U.S. Army Corps of Engineers to maintain that channel. As part of that responsibility, the channels are monitored for shoaling and the situation warrants it maintenance dredging is performed. As part of the Federal standard for the project disposal areas are acquired by the local sponsor. The disposal option with the least cost is designated the baseline for the project. If the local sponsor should desire another option then, this option is cost shared. The authorization for maintenance of the Federal channel was authorized by House Document 133, 81st Congress, 1st Session.

d. General Description of Dredged or Fill Material

(1) General Characteristics of Material. The material to be dredged is sandy shoal material.

(2) Quantity of Material. Approximately 500,000 cubic yards of material would be dredged.

(3) Source of Material. The dredged material would come from the St. Augustine Harbor Entrance channel.

e. Description of the Proposed Discharge Site.

(1) Size and Location. The disposal area is located south of the inlet either at Anastasia State Recreation Area, St. Augustine Beach or the nearshore disposal area adjacent to St. Augustine Beach.

(2) Type of Site. The disposal area is a beach environment along the Gulf coast.

(3) Type of Habitat. The habitat at the discharge site

is sandy beach, dunes and surf.

(4) Timing and Duration of Discharge. The dredging would occur for approximately 90 days at a dredging frequency of once every 7 years.

f. Description of Disposal Method. The material would be slurried and pumped to the beach through a pipeline. As the sandy material settles out of solution and is deposited on the beach, a berm is constructed between the discharge and the surf using a front end loader or bulldozer. The return water from the bermed area returns to the surf zone.

II. Factual Determinations

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. Gentle sloped beach and littoral zone.

(2) Sediment Type. The material is graded coarse sand dredged from the St. Augustine inlet. The tidal flows and littoral transport cause the sedimentation of coarse grained materials in the navigation channel.

(3) Dredged/Fill Material Movement. The material would be placed in the beach/littoral drift zone. During the yearly cycle, the beach accretes and erodes with a general southern movement of material along the beach.

(4) Physical Effects on Benthos. There would be a covering and smothering of clams and worms that inhabit the surf zone. These organisms would not be significantly affected because of the small amount of sediments covering these organisms and their ability to burrows towards the surface.

(5) Other Effects. After the beach placement, there is a general compacting and erosion process which establishes the equilibrium state of the beach. Sometimes escarpments form along the beach during this erosion process.

(6) Actions Taken to Minimize Impacts. Tilling is conducted if beach compaction exceeds 500 PSI or if escarpments form prior to sea turtle nesting season.

b. Water Circulation, Fluctuation and Salinity Determinations

(1) Water

(a) Salinity. No impacts to salinity at disposal site.

(b) Water Chemistry. There would be no affect because the] is clean sand.

(c) Clarity. Effluent out of the return water from the bermed area will meet State water quality criteria for turbidity.

(d) Color. There would be no relative differences to receiving water color expected other than localized turbidity.

(e) Odor. The disposal site is located adjacent to inhabited areas and any odors will be temporary. The effluent return to the Gulf should have little or no odor and is not expected to cause either short of long-term odor problems in the Gulf.

(f) Taste. Not applicable.

(g) Dissolved Gas Levels. There would be no impact because the surf zone has a high level of atmospheric mixing.

(h) Nutrients. None.

(i) Eutrophication. None.

(2) Current Patterns and Circulation. Not applicable.

(3) Normal Water Level Fluctuations. Not applicable.

(4) Salinity Gradients. Not applicable.

(5) Actions That Will Be Taken to Minimize Impacts. The disposal site will be operated to maintain state water quality standards.

c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulate and Turbidity Levels in Vicinity of Disposal Site. There will be a short-term increase in the suspended particulate/turbidity in the return effluent from the bermed area. Levels should not exceed state standard.

(2) Effects (degree and duration) on Chemical and Physical values

- (a) Light penetration. Slight light penetration reduction will be temporarily experienced at the disposal site effluent return in the surf zone.
- (b) Dissolved Oxygen. None.
- (c) Toxic Metals and Organics. None.
- (d) Pathogens. Not Applicable.
- (e) Aesthetics. There would be construction activities along beaches used for recreational activities. Some beach activities such as sea shell gathering increase because of the disposal operations. The operation also becomes recreation as it is a curiosity to beach goers.
- (f) Others as Appropriate. None.

(3) Effects on Biota (consider environmental values in sections 230.21, as appropriate)

- (a) Primary Production, Photosynthesis. None.
- (b) Suspension/Filter Feeders. Little or no impact is expected.
- (c) Sight Feeders. Little or no impact is expected.

(4) Actions taken to Minimize Impacts. Dredged material will be dewatered in the bermed area and most suspended particulates will settle out before the effluent is returned to the surf zone.

d. Contaminant Determinations. No sources of pollution have been identified in the project area, therefore, no contaminants are expected to be encountered. In addition, the sandy material has a relatively low capacity for bonding with many contaminants.

e. Aquatic Ecosystem and Organism Determinations

- (1) Effects on Plankton. No significant effects.

(2) Effects on Benthos. There would be no significant impacts on benthos in the area from the return water plume.

(3) Effects on Nekton. None.

(4) Effects on Aquatic Food Web. There would be no significant impact on the aquatic food web within the surf zone.

(5) Effects on Special Aquatic Sites.

(a) Sanctuaries and Refuges. Not applicable.

(b) Wetlands. Not applicable.

(c) Mud Flats. None.

(d) Vegetated Shallows. None would be affected.

(e) Coral Reefs.

(f) Riffle and Pool Complexes. Not applicable.

(6) Threatened and Endangered Species. Sea turtles use the beach for nesting. A nest monitoring and relocation program would minimize the affects of beach placement on these species. Manatees use the intracoastal waterways. There would be no affects on manatees because standard state and federal conditions for dredging will be implemented to protect the manatees. The Anastasia Beach Mouse is located in the primary and secondary dunes of Alternative 1.

(7) Other Wildlife. There would be an increase in the amount of migratory bird nesting and sea turtle nesting habitat available.

(8) Actions to Minimize Impacts. Work schedules would try to avoid migratory bird and sea turtle nesting periods. However, should the dredging be delayed precautions will be taken to avoid impacting nesting until the project is complete. Also precautions will also be taken to avoid impacting manatees within the work area. If work is planned in the Anastasia State Recreation Area, no equipment would be allowed in the dunes unless a capture and relocation program is implemented in order to protect the beach mouse.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination. Not applicable.

(2) Determination of Compliance with Applicable Water Quality Standards. The discharge return water must comply with State water quality standards.

(3) Potential Effects on Human Use Characteristic

(a) Municipal and Private Water Supply. Not applicable.

(b) Recreational and Commercial Fisheries. Immediate impacts to commercial fisheries resources will be insignificant.

(c) Water Related Recreation. There would be a disruption of normal beach recreational activities during placement of sand along the beach.

(d) Aesthetics. There would be aesthetic impacts during beach placement activities from the presence and operation of heavy equipment, the pipeline, and the discharge of slurried material along the shoreline. There will be a minor temporary adverse impacts to project area aesthetics because of the smoke from the dredge engine and placement of slurried sand on the beaches to the south. This operation is not located near inhabited areas.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The Anastasia State Recreation Area is located adjacent to the entrance channel to the south. In order to use any of the disposal alternatives, pipelines must be placed along the shoreline either along the dunes or below the waterline seaward of the foredune.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. None are apparent.

h. Determination of Secondary Effects on the Aquatic Ecosystem. Not applicable.

APPENDIX II

ENDANGERED SPECIES CONSULTATION

1.0 INTRODUCTION

This study was authorized by Section 933 of the 1986 Water Resources Development Act (Public Law 99-662). The purpose of this study is to assess the need and feasibility of beach disposal of maintenance material obtained from the Federal navigation dredging channel project.

2.0 PROJECT DESCRIPTION

The Jacksonville District of the U.S. Army Corps of Engineers (Corps) is currently determining the feasibility of placing beach compatible material dredged from the St. Augustine Inlet onto St. Augustine beach. The study area is shown in Figure 1. Figure 1 also shows the potential nearshore disposal areas which are about 3.5 miles south of the inlet. If on-shore beach disposal is selected, the proposed beach (2.5 miles in length) begins about 2.7 miles south of the inlet.

3.0 Background

St. Augustine Beach is a barrier island located along the Atlantic coast in St. Johns County in northeastern Florida, approximately 65 miles south of the Georgia border and 30 miles south of the City of Jacksonville. St. Augustine Beach is separated from the rest of St. Johns County by the St. Augustine Inlet to the north and the Intracoastal Waterway to the west.

Historically, this area of St. Johns County had been highly unstable, and in recent years, St. Augustine Beach has experienced significant erosion. Before stabilization of the St. Augustine Inlet, shoreline position fluctuated greatly as the inlet frequently experienced changes in width, depth, alignment and position. Following the stabilization of the inlet in the 1940's, the adjacent shorelines also stabilized, but the beaches to the south experienced erosion. The construction of jetties and the navigation channel at the inlet have partially obstructed the south-bound littoral transport of sediment along the coast, further contributing to erosion.

In response to sand shoaling inside the inlet and causing increased navigational difficulties during the late 1960's, annual maintenance dredging of the inlet was initiated by the Corps in the 1970's, with the exception of 1972 and 1973. As a result of the 1970's dredging, only one dredging effort was required in 1986, requiring the use of a hopper dredge.

To ensure safe navigation of vessels entering the inlet bound for the Intracoastal Waterway, the Corps must continue its periodic maintenance dredging of the inlet. The subsequent disposal of the dredged material must occur on an approved offshore spoil site or be placed onto an eroded beach.

Through the Section 933 Study, state and Federal agencies will determine if beach compatible material collected from the dredging of the inlet should be placed along an eroded section of St. Augustine Beach to provide both storm protection and recreational opportunities for the proposed project area.

4.0 General Description of Project Areas

4.1 Beach Zone

The intertidal beach zone and supralittoral beach occupy the entire length of the project area. These zones are variously composed of quartz sand and shell hash. During the March 9, 1994, site evaluation, the Service photographed various segments of the 2.5 miles of beach (Figures 2-14). The site inspection was conducted at a falling tide.

Systematic sampling was not done along the project site. We did not anticipate changes in species composition or abundance since no restoration work had been done along most of the shoreline within the project area.

The federally threatened loggerhead sea turtle (*Caretta caretta*) regularly nests on this barrier island, while the green (*Chelonia mydas*) and leatherback (*Dermochelys coriacea*) sea turtle nests infrequently on the island. Sea turtle nesting and possible impacts are further described in the Biological Opinion section of this report.

During the site inspection, shorebird diversity was low. Sandpipers (Scolopacidae) were observed using the exposed beach at low tide, brown pelicans (*Pelecanus occidentalis*) and red-breasted mergansers (*Mergus serrator*) were observed offshore, and ring-billed gulls (*Larus delawarensis*) were seen adjacent to the project site. The Florida Game and Fresh Water Fish Commission has reported that two state-listed species have been observed in the project area; the threatened least tern (*Sterna antillarum*) and the black skimmer (*Rynchops niger*).

Sandy beaches are populated by small, short-lived infauna with high species density and substantial reproductive potential and recruitment, for example decapod crustaceans, bivalves, spionid worms, and burrowing haustoriid amphipods. These communities occur in relatively well-defined zones and depend to some extent on the nature of the substrate.

The dune system is heavily developed and moderately impacted above mean high water due to a strong tourist industry in this area. Restaurants, motels, condominiums and residential homes line the upper reaches of the beach, and driving is permitted along the shoreline. The dune system is intact in some areas, while there are other areas exhibiting severe erosion of the dune face. Along the primary dune, vegetation is a mixture of sea oats (*Uniola paniculata*), beach pennywort (*Hydrocotyle bonariensis*), beach tea (*Croton*

punctatus), gaillardia (*Gaillardia pulchella*), saltwort (*Batis maritima*), sea rocket (*Cakile edentula*), railroad vine (*Ipomea brasiliensis*) and prickly pear cactus (*Opuntia humifusa*).

The endangered Anastasia Island beach mouse (*Peromyscus polionotus phasma*) is found in the primary and secondary dune systems throughout the length of the project site. Further discussion regarding this species is found in the Biological Opinion section of this report.

4.2 Nearshore Disposal Site

The nearshore disposal areas are located approximately 3.5 miles south of the St. Augustine Inlet; identified as areas A, B, and C, Figure 1. To determine if a dive was necessary on the disposal areas, the Corps contracted with a firm to conduct a side scan sonar investigation.

On August 11, 1994, the Corps forwarded the Service a copy of the consultant's report. The objective of the investigation was to identify and map the extent of hard bottom areas in the vicinity of the project site. The survey limits were identified by the Corps and encompassed the nearshore region (approximately shoreline seaward to the 18-foot isobath) between DEP's Range Monuments R135 and R155. The total survey area was about 2.7 square miles.

The results of the survey revealed no distinguishable bottom features that could be classified as exposed hard bottom or outcrops. It was the consultant's opinion the areas were comprised solely of a sandy bottom terrain. As a result of the survey, the Service does not believe a dive is necessary.

Based on core borings conducted by the Corps, there are no rock formations in any of the disposal areas, and there is approximately 10-20 feet of sand over the geologic formation.

5.0 Project Impacts

5.1 Beach Zone

The placement of clean sand on the beach will result in significant mortality of benthic organisms. This mortality will be temporary as the benthic animals have a high reproductive and recruitment potential. Continental Shelf Associates, Inc. (1989) report that benthic fauna may recover from beach "filling" within a year.

While sand is being pumped on the beach, birds are known to feed on benthic organisms found within the dredged material. After this initial pulse of prey, there will be a period of time in which the beach will probably be sterile. This should be temporary. Benthic organisms adjacent to the restored beach will repopulate the affected area quickly. Fish

may temporarily vacate the surf proximal to the nourishment activity if turbidity becomes too great.

The effects of beach nourishment on nesting sea turtles and recommendations to minimize impacts are provided in the Biological Opinion section of this report.

5.2 Inlet Dredging

The primary impact of sand removal from the inlet is the immediate mortality of benthic organisms. These species will likely reestablish within a relatively short period of time should the resultant depressions fill with sediment similar to that of the original matrix. If the depressions fill with fine sediment, benthic faunal recolonization may be prevented.

Motile species, such as fish, may move out of the area. Some fish may initially die during sand removal. Fine sediment generated by this activity may kill fish by suffocation. When sand removal is complete, fish would be expected to return within a relatively short period of time.

The endangered West Indian manatee (*Trichechus manatus*) is found within the inlet area. Potential impacts to this species are discussed in the Biological Opinion section of this report.

6.0 Biological Opinion

CONSULTATION HISTORY

On July 21, 1993, the Service provided the Corps with a list of threatened and endangered species that may be found within the area of influence of this project. The list included loggerhead, green, and leatherback sea turtles, Anastasia Island beach mice, and manatees. The piping plover was added later. On March 1, 1994, the Corps evaluated the impact this project would have on the above listed species, in accordance with Section 7 of the Endangered Species Act of 1973, as amended, and determined may affect for the sea turtles, manatee, and Anastasia Island beach mouse. In order to combine the Biological Opinion with the Fish and Wildlife Coordination Act Report, the Corps agreed to postpone the issuance of the opinion until the side scan sonar investigation of the near-shore disposal sites were completed. On August 11, 1994, the Corps provided the results of the side scan sonar investigation. The Service has sufficient information to complete the Section 7 consultation.

BIOLOGICAL OPINION

Piping Plover

The piping plover does not nest in Florida; however, this species is found along both coasts in the winter. The closest known wintering beach to the project site is Huguenot Memorial Park in Duval County. Sightings of several individuals within Anastasia State Recreation Area have been recorded by DEP during annual bird surveys. The Service does not believe this project, however, is likely to adversely affect this species.

Anastasia Island Beach Mouse

The Anastasia Island beach mouse was historically known from the Duval-St. Johns County line southward to Matanzas Inlet, St. Johns County, Florida (Fish and Wildlife Service Recovery Plan 1993). It currently occurs only Anastasia Island primarily at the north (Anastasia State Recreation Area) and south (Fort Matanzas National Monument) ends of the island, although beach mice still occur at low densities in remnant dunes along the entire length of the island.

Essential habitat for this species is primary and secondary dunes. As the population increases, the mice expand their range and occupy less suitable habitat landward of the dune system. Beach mice are found in the dune system within the beach disposal area.

The Corps stated in their biological assessment that beach mice may be adversely affected if the material is placed on the beach. The Corps based their determination on the fact that sand may be deposited up to the toe of the primary dune which will affect beach mice, if present. Incidental take of this species may occur if beach mice are buried in their burrows during sand deposition.

Based on our review of this project, and the known distribution of beach mice on the barrier island, it is the Service's Biological Opinion that beach disposal is not likely to jeopardize the continued existence of this species. The project site represents a small percentage of the known range of this species and beach mice are found in the dune system along the barrier island. Beach mice have a high reproductive potential, and animals lost will be replaced within a short period of time.

West Indian Manatee

Manatees are found throughout St. Johns County, including St. Augustine Inlet. It is likely that manatees will be found in or adjacent to the inlet during the dredging operation, or when barges are in route to one of the disposal sites.

The Service, DEP and the Corps have develop standard manatee construction precautions to protect manatees during construction operations. As in past maintenance dredging projects, these conditions have been included in the contract. The Service, therefore, believes this project is not likely to adversely affect the manatee. We recommend that the Corps include the standard manatee construction precautions (copy enclosed) as conditions of the contract.

Loggerhead, Green and Leatherback Sea Turtles

The loggerhead turtle is the most common nesting sea turtle in Florida. Throughout Florida, there are approximately 49,000 nests per year. Primary nesting sites on Florida's east coast can be found from Brevard County south. St. Johns County beaches are not high density nesting areas. In 1990, a peak year for sea turtle nests on all Florida's beaches, 19 loggerhead turtles nested on the beach within Anastasia State Recreation Area. In 1991, five loggerheads nested and in 1992 and 1993 ten loggerhead sea turtles nested each year. We do not have specific nesting data for the project site; however, based on the beach conditions, such as lighting from residences and vehicle traffic, we would anticipate nesting at equal or lower densities than that recorded for the recreational area.

The endangered leatherback turtle nests in Florida; however, the number of nests are quite low. In 1991, one nest was recorded on the beach at Anastasia State Recreation Area, and in 1993, there was one nesting attempt.

Green sea turtles nest more frequently on Florida beaches than the leatherback sea turtle. The majority of green sea turtle nests are found from Brevard County south. The 1993 nesting data indicated that one green turtle nest was recorded for Anastasia State Recreation Area.

The Service is concerned that if beach restoration is conducted during the nesting season (April through September) this activity may discourage turtles from nesting. Lights from the barges or dredge at the inlet and nearshore may inhibit turtles from approaching the beach. Work during the nesting season may also result in the inadvertent crushing or burying nests. The Service supports DEP's position and Florida State Rule 16B-41, which states that "in areas where sea turtles nest, coastal construction should not occur later than May 15 unless sufficient economic, technological, environmental, and/or public health, safety and welfare factors exist."

Based on previous beach restoration projects, the Corps has agreed to relocate all nests to a hatchery or safer beach location if the work is done during the nesting season. Nest surveys and relocations will be conducted by DEP-permitted personnel with prior experience and training in nest survey and relocation procedures. The Corps has also agreed that, immediately following construction, cone penetrometer readings will be taken